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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,629	10/03/2000	Yuichi Nakao	68596	7023

23872 7590 04/10/2002

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EXAMINER
MARTIR, LILYBETT

ART UNIT	PAPER NUMBER
2855	

DATE MAILED: 04/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/677,629	NAKAO ET AL.	
	Examiner	Art Unit	
	Lilybett Martir	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *24 January 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cage et al. (Pat. 4,876,898) in view of Lew et al. (Pat. 5,663,509). Cage et al. teaches the claimed invention, including:

- Two flow tubes as in elements 11 and 11' having joint ends, an entry side manifold as in element 12 that is connected to one set of said joint ends of said two flow tubes and branches a fluid being measured from an inlet port into said two flow tubes (Col.6, lines 26-28), and exit side manifold as in element 12' connected to another set of said joint ends of said two flow tubes into an outlet port to discharge said fluid being measured (Col. 6, lines 28-30), a drive unit as in element 16 for driving and resonating one of said flow tubes with another of said flow tubes at mutually opposite phases, and a pair of oscillation sensors as in elements 17 and 18 installed at locations horizontally symmetrical with respect to an installation location of said drive unit for sensing a phase difference proportional a coriolis force; said two flow tubes as in elements 11 and 11' being connected to the entry side manifold as in

element 12 and the exit side manifold as in element 12' at the joint ends as noted in Figure 1; and said entry side and exit side manifolds being connected to said flow tube at said joint ends at a predetermined rise angle in a same direction as said flow tubes (Col. 13, lines 38-42); wherein a change of flow paths from the two flow tubes to external piping is inherently addressed by flow paths in the manifolds being smoothly bent from an inlet of said entry side manifold and an outlet of said exit side manifold to the joint ends connecting said two flow tubes, as in claim 1.

- A sealed pressure-resistant case of a cylindrical shape in axis direction as in element 14 with openings of the cylindrical portion thereof closed by end plates, wherein said entry side and said exit side manifolds as in elements 12 and 12' are installed at corners of said cylindrical portion and passed through said corners as noted in figures 1 and 5, as in claim 2.

- The pressure resistant case as in element 14 arranged around said two flow tubes 11 and 11' as noted in Figures 1, 2 and 5; said entry side and exit side manifolds as in elements 12 and 12' having a pair of integrally formed disc-shaped flanges as noted in Figure 1 to which both ends of said case are fixedly fitted; the cross-sectional shape of said pressure resistant case being an oval shape with the major axis oriented in the curved direction of said flow tubes (Col. 12, lines 33-37), with the length

of said major axis smoothly and gradually reduced from the axial central part thereof to both ends thereof into a substantially circular shape over a predetermined length near both ends as noted in Figure 1, as in claim 3.

- A temperature sensor as in element 72 provided inside said pressure resistant case as in element 14 near said joints connecting said flow as noted in Figure 1 for compensating the thermal effects, as in claim 4.
- Two flow tubes as in elements 11 and 11', an entry side manifold as in element 12 with an inlet port and two outlet ports, said two outlet ports being connected to said first joint ends of said two flow tubes and dividing an entry passage from said inlet port into said two flow tubes (Col. 6, lines 26-28), said entry passage having a smooth curve from said inlet port to said outlet port as suggested in Col. 13, lines 38-41; an exit side manifold as in element 12' with an outlet port and two inlet ports, said inlet ports being connected to said second joint ends of said two flow tubes and joining exit passages from said inlet port to said outlet port (Col. 6, lines 28-30), each of said exit passages having a smooth curve from respective said inlet ports to said outlet port as suggested in Col. 13, lines 38-41; a drive unit as in element 16 for driving and resonating one of said flow tubes with respect to another of said flow tubes at mutually opposite phases; a pair of oscillation sensors as in elements 17 and 18 installed at locations symmetrical with respect to said drive unit as noted in Figure 1for sensing a phase difference

proportional to a coriolis force on fluid in said two flow tubes, as in claim 5.

- A sealed pressure case as in element 14 surrounding said two flow tubes as in elements 11 and 11', said pressure case having a cylindrical shape with ends of said cylindrical shape closed by end plates and forming corners with said cylindrical shape as noted in Figures 1 and 5, said entry and exit manifolds being arranged in said corners of said case, as in claim 8.
- Said end plates being flanges of said entry and exit manifolds 12 and 12'; a radial cross section of said pressure case having an oval shape with a major axis of said oval shape being oriented in a curved direction of said flow tubes as noted in Figure 5, a length of said major axis being a maximum at a central portion of said pressure case and diminishing toward said ends of said cylindrical shape to have said cross section pressure case change to a substantially circular shape at said ends of said cylindrical shape as noted in Figures 1,2 and 5, as in claim 9.
- A second temperature sensor arranged on one said flow tubes and said manifolds, said temperature sensor measuring temperatures affecting the rigidity of said flow tubes (Col. 11, lines 8-12), as in claim 10.

But he does not disclose:

- The parallel tubes being curved into an arch shape, as in claim 1.

- A temperature sensor for compensating the thermal effects of a distance between the fixed ends on both sides of said flow tubes, as in claims 4 and 10.
- The axial direction of said first joint ends being non-parallel with said axial directions of said second joint ends, as in claim 6.
- The axial direction of said first joint ends being angularly spaced from said axial directions of said second joint ends, as in claim 7.
- Said each curve being continuous from said first joint end to said second joint end, as in claim 11.

Lew et al. teaches a flow measuring device having two parallel conduits as in elements 44 and 45 joined to manifolds 47 and 47 where there joint ends are not positioned in a parallel manner, but instead they are positioned in an angularly spaced manner, said conduits having a curvature that is continuous as noted in Figure 5.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the coriolis flow meter of Cage et al. using the teachings of the flow meter Lew et al. by providing said coriolis flow meter with two conduits that have a substantially ached shape with joint ends that are angularly spaced and not parallel for the purpose of modifying the shape of said known components in order to provide multiple conduits that can be resonantly oscillated about an axis that will allow flow measurements to be made, since a variation in the shape of an element that constitutes a known apparatus is merely design choice, and since Cage et al. himself suggests in Col. 13, lines 30-33 that a plurality of shapes of flow conduits could

be utilized on his invention as long as they oscillate in a resonant manner. And since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art; St. Regis Paper Co. v. Bemis Co., 193 USPQ 8; it would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the coriolis flow meter of Cage et al. by providing it with a second temperature sensor for the purpose of providing the means necessary to keep track of ambient conditions such as the temperature since it is well known in the art that temperature affects the elasticity of the components of a Coriolis flow meter, therefore making said flow measurements more accurate by having two sensors.

Response to Arguments

Applicant's arguments filed on January 24, 2002 have been fully considered but they are not persuasive. A mere variation in the shape of some elements that compose a known apparatus is not germane of patentability.

Applicants amendments raised new issues that made necessary the new art to be applied and therefore, the arguments presented against the office action mailed in October 24, 2002 are said to be moot due to the new grounds of rejection.

Citation of Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art considered pertinent during examination of the examined application is:

- Cage (Pat. 4,768,385) Parallel path coriolis mass flow meter.
- Van Cleeve et al. (Pat. 5,850,039) Coriolis flow meter having axially compliant case ends.
- Zaschel (Pat. 5,549,009) Apparatus for determining and dosing mass flows.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (703)305-6900. The examiner can normally be reached on 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Fuller can be reached on (703)308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LM

Lilybett Martir
Examiner
Art Unit 2855

LM
April 4, 2002

Benjamin R. Fuller
Supervisory Patent Examiner
Technology Center 2800